

INSECT DAMAGE TO OLD OAK BEAMS AT LOWER FORT GARRY, MANITOBA

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Old oak beams used in construction of ceilings of first and second storeys and lintels of the limestone warehouse, Lower Fort Garry, Manitoba, were attacked by Dermestes lardarius, Priobium sericeum, and Pseudohadrotoma sp. The insects were probably brought in on goods or originated locally.

Les vieilles poutres de chêne utilisées dans la construction des plafonds du premier et du deuxième étages, et des linteaux des entrepôts en pierre à chaux de Lower Fort Garry, Manitoba, ont subi l'attaque de Dermestes lardarius, Priobium sericeum et Pseudohadrotoma sp. Ces insectes furent probablement introduits avec des marchandises, ou bien étaient d'origine locale.

INTRODUCTION

Lower Fort Garry was built 32 km north of Winnipeg after a disastrous flood ruined old Fort Garry (Winnipeg) at the forks of the Red and Assiniboine rivers in 1826 (Goldring, 1970). Construction was started in 1831 and finished in 1847 with completion of the walls surrounding the buildings. In 1963, an extensive restoration of the fort began. In the process of restoring the old warehouse building, H. Van der Putten, Project Manager of Restoration of Lower Fort Garry, observed considerable insect damage (Fig. 6,7) to the old oak beams. Some of the damage resembled that caused by the death watch beetle, *Xestobium rufovillosum* (De Geer), a destructive insect introduced from Europe and known to attack oak timbers in old buildings.

The purpose of this study was to identify the insect species damaging oak beams and speculate on their origin.

THE WAREHOUSE BUILDING

The three-storey limestone warehouse building (Fig. 1), constructed between 1835 and 1845 (Van der Putten, pers. comm.), measures 21 m long and 9 m wide. Oak used for the ceilings of the first and second storeys and lintels over the windows of the warehouse was floated down the Red River to the fort from the United States and areas around the fort (Van der Putten, pers. comm.). The wood was cut into beams measuring 9 m long, 17.5–22.5 cm wide, and 20.0–22.5 cm high; the beams were spaced 60–75 cm apart. The lengths of the lintels varied from 1.8 to 7.2 m.

The building was originally used by the Hudson's Bay Company to house supplies for the fur trade, but it also served several subsequent functions: a barracks for the military (1846–48), the first provincial and later federal penitentiary (1871–77), and Manitoba's first asylum (1885–86) (Goldring 1970). It was while the warehouse was used as a penitentiary that a lime wash, still evident today (Fig. 2), was painted over the beams and lintels (Van der Putten, pers. comm.).

METHODS AND MATERIAL

Infested oak beams from the warehouse were cut into small sections and shipped to the Northern Forest Research Centre in late November 1976. These were split into smaller pieces and examined for insects within the wood. Adults for identification were obtained by placing those pieces containing living larvae in 73.12-liter galvanized metal garbage cans, modified as in Fig. 4. The cans were placed in a rearing room with a temperature of 21 C and relative humidity of 50%. Daily observations were made for adult emergence.

INSECT SPECIES AND DISCUSSION

Three species of insects were found in the oak beams.

Dermestes lardarius Linnaeus

This was the most abundant species present, observed throughout the beams, although rarely in lintels or the spruce floor. All larvae, pupae, and adults in the wood were dead (Fig. 6). Their presence in the oak beams can be attributed to the building having been used to store supplies of the Hudson's Bay Company. Full-grown larvae, which feed on furs, hides, and anything of animal origin, are known to wander about in search of some compact material in which to bore a tunnel to pupate (Hinton 1945). The compact material near at hand was the oak beams and spruce floor. Instances of the larder beetle damaging structural wood are common. Hinton (1945) listed a number of such reports, and Craighead (1950) and Baker (1972) noted that valuable cargos of lumber have been damaged in ship holds where hides had previously been stored.

It is not known for certain what killed the beetles in the wood. A chemical analysis of the dead larvae and adults did not disclose any toxic chemicals such as lead, which was present at 140 ppm in the lime wash. One explanation that may account for the sudden death of numerous larvae, pupae, and adults in the wood is cold winter temperatures. The warehouse was probably left unheated for at least one year before the military took over in 1846. If this is so, then dead larvae, pupae, and adults of the larder beetle must have been entombed in the wood for over a hundred years.

We can only speculate on the possible origin of the larder beetles in the warehouse. Records indicate that there was little contact between Lower Fort Garry and eastern Canada (Van der Putten, pers. comm.), but supplies were frequently received from England. It would appear then that this insect originated from England on or in any number of things listed by Hinton (1945).

Priobium sericeum (Say)

The numerous small exit holes and dustlike powder on the oak beams indicated that the beams had been attacked by an anobiid beetle. Adults obtained from rearing the larvae in the beams were not death watch beetles, *Xestobium rufovillosum*, as expected, but another member of the same family, *Priobium sericeum* (Fig. 3). Larvae and exit holes were found at the end of the beams up to 1.2 m from the wall and in the lintels. Adults of this species emerged in the laboratory on 14 February and 14 March 1977 and 5 January 1978.

This is a native species, which White (1962) recorded from dead branches of oak, wild cherry, and hickory. According to Simeone (1962), it is distributed from Nova Scotia to Wisconsin in the north, southwestward to Arizona, and southeastward to Texas and Florida. The Canadian National Collection, Ottawa, has specimens only from Nova Scotia, New Brunswick, Quebec, and Ontario. This is the first record of *Priobium sericeum* in Manitoba.

After the oak was floated down the Red River to Lower Fort Garry, it probably became infested by a local population of *Priobium sericeum*, which laid eggs in exposed wood such as knots, cracks, and crevices. After hatching the larvae entered the wood and riddled it with tunnels, packed with powdery dust. The small round surface holes mark exits of adults of *Priobium sericeum*. Populations of this insect started either outside the warehouse when the oak was stacked ready for use or within the warehouse from infested oak used in ax handles, farm implements, furniture, or frame-work of Red River carts.

Pseudohadrotoma sp.

Only four adults (Fig. 5) of this species were obtained. Dr. E.C. Becker, Biosystematic Research Institute, Ottawa, indicated that it is undescribed. Adults emerged on 2 and 14 February and 19 December 1977, and 4 June 1978. In Beal's key (1967) to species of *Pseudohadrotoma*, the new species is close to *Pseudohadrotoma falsa* (Horn), which Beal indicated as being beaten from *Quercus* and which is probably a general scavenger feeding on the remains of other insects in burrows of wood. This new species probably fed on the remains of larger beetles in the oak beams and did not cause primary damage to the wood.

Of the three species of insects reared from infested oak beams at Lower Fort Garry, Manitoba, only *Dermestes lardarius* and *Priobium sericeum* caused primary damage. Individuals of the former species, although most abundant, were all killed, apparently by extreme cold weather when the warehouse was left unheated for a year. Those of the latter species are still thriving.

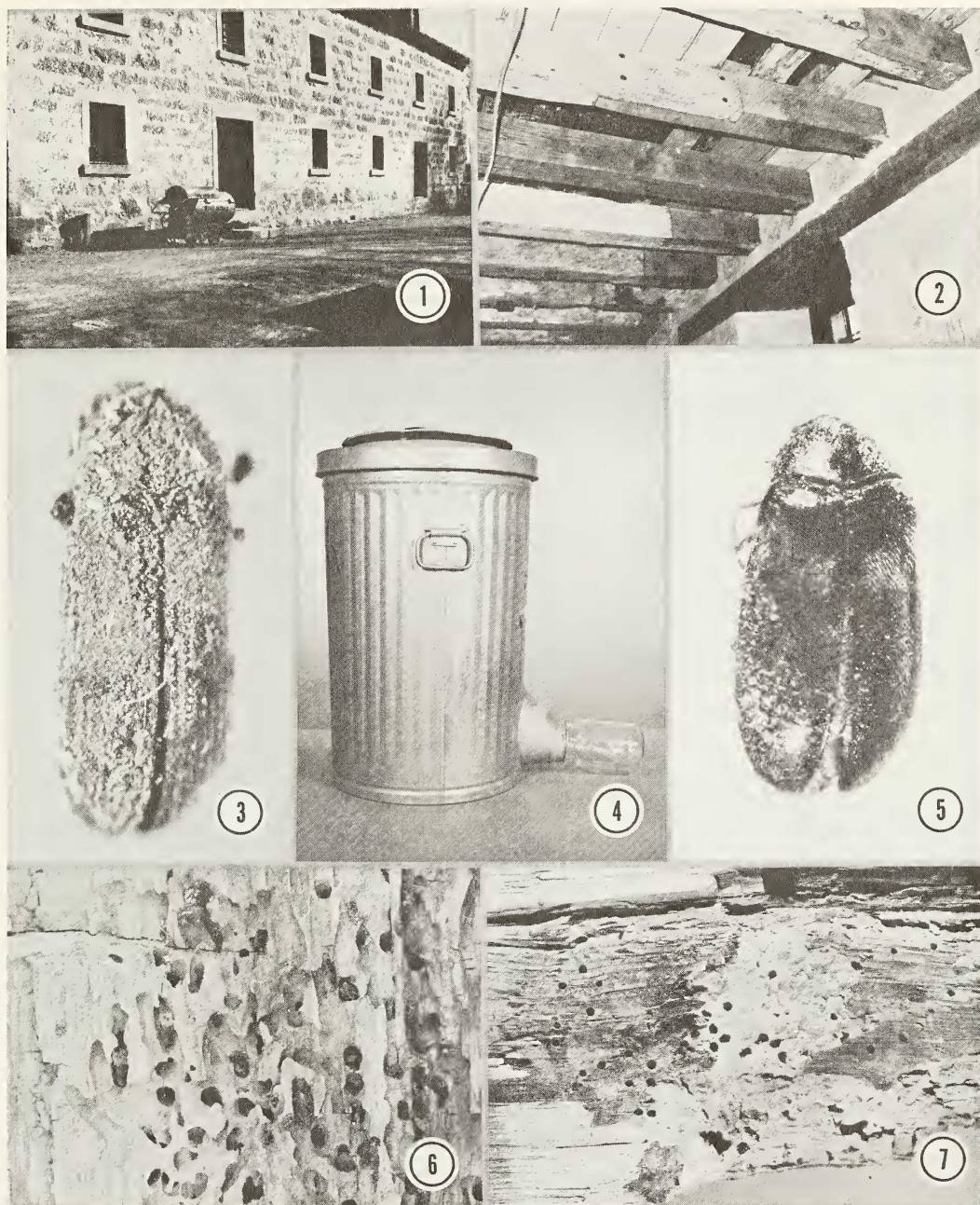
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Figures 1 – 7. Fig. 1, limestone warehouse, Lower Fort Garry, Manitoba; Fig. 2, oak beams on ceiling showing whitewash and section of beam restored; Fig. 3, adult of *Priobium sericeum* just emerged from oak beam; Fig. 4, modified galvanized metal garbage can used for rearing insects in oak beams; Fig. 5, adult of *Pseudohadrotoma* sp.; Fig. 6, dead adults of *Dermestes lardarius* in oak beam; Fig. 7, holes in oak beam made by *Dermestes lardarius* and *Priobium sericeum*.

